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390. This is the same as 356, and its solution will be found at page 163 of Vol. VIII. It was inserted in No. 2 by an oversight.

391. "Given

$$\log. 91 = 1.95904 \pm r,$$
$$\log. 92 = 1.96379 \pm r,$$

find log. 91.5 to five decimals, by simple proportion from the difference; and find the probable error of this logarithm."

ANSWER BY PROF. ASAPH HALL.

If f be the interpolating factor we have $f\Delta = 237.5$, and the value of log 91.5 is 1.96142, or 1.96141.

To find the probable error of this value, let r_1, r_2, be the errors of the two logs, and r_3 the error made in stopping the product $f\Delta$ at the given decimal; then the real error of the interpolated value is

$$(1 - f) . r_1 + f . r_2 + r_3.$$

Assuming f constant, the probable error is found from the mean value of some power of the real error; $-r_1$, r_2, r_3 being independent variables between the limits ± 0.5. The following are the results given by Bremiker, the editor of our best logarithmic tables: Since $r = 0.25$,

$f =$ 0.0 : 0.1 : 0.2 : 0.3 : 0.4 : 0.5 : 0.6 etc.

Pr. Er.= 0.293 : 0.279 : 0.270 : 0.263 : 0.262 : 0.261 : 0.262, etc.

The method that I gave in the preceding No. of the ANALYST is incorrect. In fact, the law of error is not that which is assumed in the method of least squares.

QUERY BY PROF. H. T. EDDY.—"When two determinants of the same order have the same algebraic value, show whether it is always possible to transform the one into the other by mere combinations of rows and colu'ns; and if possible transform the two following values of $2bc\cos A - b^2 - c^2$, the one into the other:

$$\begin{vmatrix} 0, & b, & c, \\ b, & 1, & \cos A, \\ c, & \cos A, & 1, \end{vmatrix} \quad , \quad \begin{vmatrix} 2bc\cos A, & b, & c, \\ b, & 1, & 0, \\ c, & 0, & 1, \end{vmatrix} .$$"

Prof. Casey answers the above query as follows:

"The two determinants are equal; but by no combination of rows or columns can $2bc\cos A$ be factored so as to transform this determinant into the other. Neither can the first be transformed into the second, as far as I can see, by any of the known laws of determinants."